Rule CIC446: CFDT pool server storage allocation was less than expected

Finding: CICS Coupling Facility Data Table (CFDT) AXM storage statistics and the CICS File Control statistics showed that the amount of storage allocated to the CFDT pool server was less than expected.

Impact: This finding has a LOW IMPACT on the performance of the CICS region. However, it could be a warning of a pending HIGH IMPACT on the performance of the CICS region.

Logic flow: When Rule CIC440, CIC441, CIC446, CIC443, CIC444, or CIC445 are produced, CPExpert analyzes CICS file assignments to CFDT pools. Rule CIC446 is produced when the amount of storage allocated to the CFDT pool server was less than expected. The finding applies only with CICS/Transaction Server for OS/390 Release 1.3, or CICS/Transaction Server for z/OS.

Discussion: A Coupling Facility Data Table is assigned to a *coupling facility data table pool* in a coupling facility. A CFDT pool consists of an XES list structure on the coupling facility. The coupling facility data table pool can contain one or more CFDTs, and there can be more than one CFDT pool defined for the coupling facility.

Access to a CFDT by CICS transactions running in an AOR is through a *CFDT pool server* that supports a specific named CFDT pool. In this context, the CFDT pool server is similar to a File Owning Region (FOR) that would be used for a normal shared data table.

The CFDT pool server is started in its own region, by executing DFHCFMN. Various parameters are provided to DFHCFMN (POOLNAME, list structure parameters, lock wait parameters, tuning parameters, etc.) to allow tailoring of the data sharing server.

During server initialization, the CFDT server acquires all of the available storage above the 16M line, as determined by the REGION size, then releases 5% of it for use by operating system services. This storage is referred to as *AXMPGANY* pool. The server also acquires 5% of the free storage below the line for use in routines which require 24-bit addressable storage. This storage is referred to as *AXMPGLOW* pool. Server statistics indicate how much storage is actually allocated and used within the storage areas above the 16M line (AXMPGANY pool) and below the 16M line (AXMPGLOW pool).

In order to prevent overloading the CFDT pool server, the number of CFDT requests that each connected CICS region can have active at a time is limited. The *CICS System Definition Guide* states that this limit is about 10 concurrent requests. Since each request requires about 40KB, the REGION size should specify at least 400KB for each connected CICS region, plus a margin of about 10% for other storage areas. Thus, for a server supporting up to 5 CICS regions, IBM suggests that you should specify REGION=2200K.

If a task in the server region or a cross-memory request runs out of storage, this is likely to result in AXM terminating that task or request using a simulated ABEND with system completion code 80A to indicate a GETMAIN failure. Although the server can usually continue processing other requests, running out of storage in a critical routine can cause the server to terminate.

It is possible that the REGION size was specified correctly initially, but additional CICS regions began using CFDTS (via the CFDT pool server, of course). In this case, it is possible that the REGION size for the CFDT pool server was not updated to account for the additional CICS regions requiring service.

Rule CIC440, CIC441, CIC446, CIC443, CIC444, and CIC445 analyze various potential problems with storage in the AXMPGANY and AXMPGLOW pools. When any of these rules are produced, CPExpert analyzes CICS file assignments to CFDT pools. Rule CIC446 is produced when the amount of storage allocated to the CFDT pool server was less than expected.

The MXG file CICFCR contains statistics related to CICS file control. CPExpert extracts file control information for those files that are assigned to a Coupling Facility Data Table. Included in these statistics is the identification of the CFDT pool server for any data set assigned to a CFDT (MXG variable A17DTCFP contains the name of the CFDT pool to which the data table is assigned).

CPExpert determines the maximum number of CICS regions concurrently using a CFDT pool server. This maximum number is multiplied by ten, to yield the maximum number of requests that could be outstanding for the CFDT pool server. Since each request requires about 40KB, CPExpert multiplies the maximum number of requests by 40KB to yield the maximum storage required for requests. This maximum storage for requests is then multiplied by 110%, to account for other required storage. These calculations yield the maximum amount of storage that should be assigned to the CFDT pool server, considering the number of CICS regions that use the CICS pool server.

Coupling Facility Data Table pool server storage statistics are available in MXG file CICCFS9D. The S9ANYSIZ variable contains the size of the storage pool area for the ANY storage pool statistics, and the S9LOWSIZ variable contains the size of the storage pool area for the LOW storage pool statistics. The sum of these two variables yields the total amount of storage allocated to the CFDT pool on the REGION= parameter.

CPExpert compares the amount of storage that *should be assigned* to the CFDT pool server (considering the number of CICS regions that use the CICS pool server), with the sum of the storage that was allocated to the CFDT pool on the REGION= parameter.

CPExpert produces Rule CIC446 when the amount of storage that *should* be assigned to the CFDT pool server (considering the number of CICS regions that use the CICS pool server) is greater than the sum of the storage that was allocated to the CFDT pool on the REGION= parameter.

Suggestion: If this finding is produced, you should consider the following alternatives:

- You should increase the storage allocated to the CFDT pool server (using the REGION= parameter). As mentioned earlier, it is possible that the REGION size was specified correctly initially, but additional CICS regions began using CFDTs. In this case, it is possible that the REGION size for the CFDT pool server was not updated to account for the additional CICS regions requiring service.

- You can "turn off" Rule CIC446 if you do not wish to be informed of the data produced by this finding. Section 3 of the CICS Component User Manual describes how to "turn off" rules.

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Reference: *CICS/TS for OS/390 Release 1.3*

CICS System Definition Guide: Section 4.3.2 (Defining and starting a coupling facility data table server region)

CICS Performance Guide: Section 4.6.13 (Coupling facility data tables)

CICS/TS for z/OS Release 2.1

CICS System Definition Guide: Section 4.3.2 (Defining and starting a coupling facility data table server region)

CICS Performance Guide: Section 4.5.13 (Using coupling facility data tables to gain performance benefits)

CICS/TS for z/OS Release 2.2

CICS System Definition Guide: Section 4.3.2 (Defining and starting a coupling facility data table server region)

CICS Performance Guide: Section 4.5.13 (Using coupling facility data tables to gain performance benefits)

